

CLAIMS

1. A video encoder (500) for encoding video signal data for an image block and a plurality of reference picture indices, the encoder comprising a reference picture weighting factor assignor (572) responsive to the relative positioning between  
5 the image block and first and second reference pictures indicated by the plurality of reference picture indices, the reference picture weighting factor assignor for calculating an implicit weighting factor for the reference picture corresponding to the particular reference picture index.
- 10 2. A video encoder (500) as defined in Claim 1 wherein the reference picture weighting factor assignor (572) comprises:  
an interpolation portion for interpolating between portions of two reference pictures disposed one before and one after the image block in display order; and  
an extrapolation portion for extrapolating from portions of two reference  
15 pictures disposed both before or both after the image block in display order.
3. A video encoder (500) as defined in Claim 1, further comprising a reference picture store (570) in signal communication with the reference picture weighting factor assignor (572) for providing a reference picture corresponding to  
20 each reference picture index.
4. A video encoder (500) as defined in Claim 1, further comprising a variable length coder (540) in signal communication with the reference picture weighting factor assignor (572) for encoding the first and second reference picture  
25 indices.
5. A video encoder (500) as defined in Claim 1, further comprising a motion compensation unit (590) in signal communication with the reference picture weighting factor assignor (572) for providing motion compensated reference pictures  
30 responsive to the reference picture weighting factor assignor.

6. A video encoder (500) as defined in Claim 5, further comprising a multiplier (592) in signal communication with the motion compensation unit (590) and the reference picture weighting factor assignor (572) for applying a weighting factor to a motion compensated reference picture.

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7. A video encoder (500) as defined in Claim 6, further comprising prediction means for forming first and second predictors from two different reference pictures.

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8. A video encoder (500) as defined in Claim 7 wherein the two different reference pictures are both from the same direction relative to the image block.

9. A method (600) for encoding video signal data for an image block, the method comprising:

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receiving (612) a substantially uncompressed image block;  
calculating (614, 616, 618) implicit weighting factors for the image block responsive to the relative positioning between the image block and first and second reference pictures indicated by first and second reference picture indices;  
computing (622) motion vectors for the image block and each of the first and  
20 second reference pictures;  
motion compensating (624) each of the first and second reference pictures in correspondence with the respective motion vectors;  
multiplying (626) each of the motion compensated reference pictures by its calculated implicit weighting factor to form a weighted motion compensated reference  
25 picture;  
combining (630) each of the weighted motion compensated reference pictures into a combined weighted motion compensated reference picture;  
subtracting (632) the combined weighted motion compensated reference picture from the substantially uncompressed image block; and  
30 encoding (634) a signal indicative of the difference between the substantially uncompressed image block and the combined weighted motion compensated reference picture along with the corresponding indices of the first and second reference pictures.

10. A method as defined in Claim 9 wherein calculating an implicit weighting factor comprises at least one of:

interpolating between portions of two reference pictures disposed one before and one after the image block in display order; and

5 extrapolating from portions of two reference pictures disposed both before or both after the image block in display order.

11. A method as defined in Claim 9 wherein motion compensating each of the retrieved reference pictures comprises determination of motion vectors for the  
10 retrieved reference pictures relative to the image block.

12. A method as defined in Claim 9, further comprising:  
encoding a picture order count in a slice header field for the image block for  
use in calculating implicit weighting factors for the image block and the plurality of  
15 reference pictures.

13. A method as defined in Claim 9 wherein the relative positioning of the image block and the plurality of reference pictures corresponds to the relative display  
20 times of the respective pictures.

14. A method as defined in Claim 9 wherein computing motion vectors comprises:  
testing within a search region for every displacement within a pre-determined  
range of offsets relative to the image block;  
25 calculating at least one of the sum of the absolute difference and the mean squared error of each pixel in the image block with a motion compensated reference picture; and  
selecting the offset with the lowest sum of the absolute difference and mean  
squared error as the motion vector.

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